

CLAIMS

1. A method for processing a layer of material sensitive to radiation, the layer being formed on a substrate, the method comprising:

irradiating the material with said radiation; and

5 developing the material to remove a portion of the material and expose a portion of the substrate, creating a pattern defined by the exposed portion of the substrate;

wherein the irradiating operation comprises:

(a) irradiating said material through a first mask which has a clear region and a non-clear region; and

10 (b) irradiating said material through a second mask which has a clear region and a non-clear region;

wherein the non-clear region of the first mask covers a position of the non-clear region of the second mask, and the non-clear region of the first mask extends beyond a boundary of the position of the non-clear region of the second mask.

15 2. The method of Claim 1 wherein a radiation dose in the operation (b) is sufficient by itself to enable the developing operation to create a pattern with a portion of the substrate exposed and a portion of the substrate not exposed.

3. The method of Claim 1 wherein a radiation dose in the operation (a) is at most $1/4$ of the radiation dose in the operation (b).

20 4. The method of Claim 3 wherein a radiation dose in the operation (a) is at most $1/9$ of the radiation dose in the operation (b).

5. The method of Claim 1 wherein the non-clear region of the second mask has a convex portion, and the non-clear region of the first mask extends beyond a position of the boundary of the convex portion.

25 6. The method of Claim 5 wherein the convex portion is an end of an elongated feature.

7. The method of Claim 5 wherein the convex portion comprises a corner, and the non-clear region of the first mask covers and surrounds the position of a vertex of the corner.

8. The method of Claim 1 wherein the non-clear region of the second mask comprises two sub-regions separated by a gap; and

the non-clear region of the first mask extends between the positions of the sub-regions across the position of the gap.

5 9. A mask set for processing a layer of material sensitive to radiation, the layer being formed on a substrate, the mask set comprising:

a first mask which has a clear region and a non-clear region; and

a second mask which has a clear region and a non-clear region;

10 wherein the non-clear region of the first mask covers a position of the non-clear region of the second mask, and the non-clear region of the first mask extends beyond a boundary of the position of the non-clear region of the second mask.

10. The mask set of Claim 9 wherein the non-clear region of the second mask has a convex portion, and the non-clear region of the first mask extends beyond a position of the boundary of the convex portion.

15 11. The mask set of Claim 10 wherein the convex portion is an end of an elongated feature.

12. The mask set of Claim 10 wherein the convex portion comprises a corner, and the non-clear region of the first mask covers and surrounds the position of a vertex of the corner.

20 13. The mask set of Claim 9 wherein the non-clear region of the second mask comprises two sub-regions separated by a gap; and

the non-clear region of the first mask extends between the positions of the sub-regions across the position of the gap.